A very severe shock of earthquake occurred at Gisborne, New Zealand (east coast), on Sept. 14. Strong shocks were also experienced at Wellington and Blenheim.

A new monthly magazine is to be started at Dunedin, of the same character as the *Contemporary Review*.

According to a letter published in the *East Anglian Times* of Nov. 24, it would appear that the Corporation of so important a town as Ipswich still authorises the use of local mean time within its liberties, and the business of the place is actually regulated by its edict. Railway time has there a distinct meaning, being 4 min. 40 sec. later than that in general use. We believe that Norwich is in an equally unscientific state as regards time-keeping. It is quite time that an end was put to this absurdity, and we hope some pressure may be brought to bear upon the authorities to effect the long-delayed and desirable introduction of Greenwich time.

In the October number of the *Quarterly Journal of the Meteorological Society of London*, appear several papers of interest, including one by Dr. Mann, the President, on some practical points connected with the construction of lightning conductors, one by Mr. Symons on a white rain or fog bow, and two very valuable and suggestive papers by the Hon. Ralph Abercrombie, on certain small oscillations of the barometer, and on barometrical fluctuations in squalls and thunderstorms. It may be suggested that the printed "Discussions" on the several papers, however interesting to the members, might be curtailed with great advantage.

The tri-daily Weather Maps of the United States for the first six months of the present year, issued under the vigorous direction of Brigadier-General Myer, have been received. They show with admirable clearness and distinctness, by the style of printing in colours adopted, the outstanding features of the weather thrice a day. These truly magnificent maps give in every case the weather probabilities for each of the great divisions into which the States have been grouped for this purpose, that are likely to follow within the twenty-four hours then *next ensuing*, and also the actual weather which has been experienced during the *past* twenty-four hours. This method is deliberately adopted by the Office for the express purpose of exhibiting equally its successes and its failures in issuing the weather probabilities, and with the further view of receiving assistance from scientific men, who are thus put in possession of materials for studying the subject, by which the rules that have led to the successes may continue to be followed, and those which have caused the failures may be avoided.

Mr. Stanford has published a handy map of India, showing the route originally sketched for the Prince of Wales's tour. Its moderate price and clearness will recommend it to many who wish to follow the Prince in his wanderings.

The *Bulletin de la fédération des Sociétés d'Horticulture de Belgique* for 1874, published under the authority of the Ministry of the Interior, gives evidence of the extent to which horticulture is made a scientific study in that little kingdom. It contains the reports of no less than twenty-five horticultural and agricultural societies affiliated to the Federation; and a list of twenty-one practical questions, for the best solution of which prizes, varying in value from 100 to 500 francs, are offered. There is also appended Prof. Morren's biographical notice of Clusius, to which we have already alluded, and a third edition, completed to October 1875, of the list of the Botanic Gardens, chairs of Botany, and Botanical Museums, throughout the world.

An admirable epitome of our knowledge respecting the vegetable palæontology of the United States is contained in M. Leo Lesquereux's reprint, "A Review of the Fossil Flora of North America," printed under the authority of the Department of the Interior. An idea will be conveyed of the wonderful advance of this knowledge in recent years, by the statement that in 1850 Brongniart described in his "Végétales Fossiles" eighteen species of land-plants from North America, whereas upwards of 1,000 species are now known. Of the numerous fossil plants brought by Dr. H. F. Hayden from his exploration of the Western Territories, and found in strata belonging to the Cretaceous formation, by far the majority are remains of Dicotyledons, and included within all three sections, of Apetalæ, Gamopetalæ, and Polypetalæ; and as far as reliance can be placed on characters derived from the foliage alone, a large number belong to genera widely distributed at the present time. The Lower Lignitic flora, on the contrary, belonging to Tertiary times, presents far less resemblance to that at present prevailing in the northern part of North America, but is of a much more southern type.

A Belgian practitioner has published a work on the "Maladies which are special to Mystics," the purport of which is to show that Louise Lateau and other persons of the same description might be really total abstainers from food for a lengthened period. The *Revue Scientifique* announces that the Belgian Society of Medicine has ordered that work to be published in its *Comptes Rendus*. M. Charbonnier, the author, advocates the theory that people may subsist without food because the nitrogen from the air can be admitted into the circulatory system, when the body has been emaciated by long abstinence. Feeding on air is an economical way of keeping soul and body together.

At the opening of the Belfast Natural History and Philosophical Society, the president, Prof. Hodges, delivered an address, in which he reviewed the industrial progress of the North of Ireland. The address was fully reported in the *Northern Whig* of Nov. 11, and has since been separately reprinted.

We have received the programme of the Cambridge Higher Local Examinations for 1876, for all who have completed the age of eighteen years before January next. The examinations are for both men and women, and the successful candidates are divided into two groups, those who obtain honours and those who do not. The subjects of examination are divided into six groups, one of which includes botany, geology, zoology, and chemistry. The programme seems to us carefully drawn up; an excellent selection of text-books is given.

PROF. NORDENSKJÖLD ON THE JENISEI

The following extract from a letter from Prof. Nordenskjöld to Mr. Oscar Dickson, dated Tomsk, Oct. 13, appears in the *Göteborgs Handels Tidning*. It describes his exploration of the river Jenisei after the departure of the *Pröven* on its homeward journey. Nordenskjöld, Lundström, and Stuxberg left the mouth of the Jenisei on August 19, in a boat built for the purpose, and well provisioned and equipped:—

"The course was taken along the shore within the multitude of low bare rocky islands which bound the mouth of the Bay of Jenisei on the north, and are named in the Russian maps, Severo-Wostotschnoi Ostrow (North-east Islands). The sounds between these islands were thought to be sufficiently deep even for large vessels, though perhaps a little fouled by rocky ground. With a favourable wind and smooth water we sailed without any considerable rest in forty-two hours without a break to Cape Schaitanskoj, arriving there the night before the 21st, thoroughly drenched and worn out with our long watch. During this time we landed only at two places, the first time at a point within Jewremow Kamen, the last rocky promontory which occurs on the eastern bank of Jenisei for a distance of 100 Swedish (upwards of 600 English) miles.

"Jewremow Kamen itself consists only of a peculiarly formed dolerite rock fifty or sixty feet high. At the bank were still collected, but for the last time during our passage up the Jenesei, true marine animals; an Appendicularia, Clio, large Beroïdæ, various Medusæ, &c. By a land excursion here we had already obtained a Harpalus, two species Staphylini, a number of Acaridæ and Poduridæ, a species of dew-worm,* &c., and as at the *Pröven's* anchorage, the vegetation has a stamp deviating very much from the flora of Novaya Zemlya. Large bush plants, even the dwarf birch, were completely absent, and the ground was in no case covered with a true mat of grass.

"The other place where we landed for a little was Krestowskoje, a now deserted *simovie* (a place inhabited both summer and winter), which, however, to judge by the number of the houses and the way in which they were fitted up, must once have had its flourishing period. All household articles were removed, and literally there was not to be found an iron nail in the wall; a proof that the inhabitants had not died out, but migrated. The vegetation in the neighbourhood of the huts was extraordinarily luxuriant, the grass and plants forming a real obstacle in walking, certainly occasioned by the quantity of fertilising animal matter which had been collected here during the time when fishing and hunting were carried on.

"The surface temperature of the water was, on our arrival at the mouth of the Jenisei + 7·8° C., but sank during the storm of the following days to + 1·5° C. At Jewremow Kamen it was + 2·5° C., but rose afterwards in the neighbourhood of Krestowskoje to + 11° C., a temperature which it afterwards retained during the whole of our journey. The water was brown in colour, but was often at the sides coloured by clayey streams.

"A little south of Jewremow Kamen the eastern side of the Jenisei is occupied by sand-banks twenty to thirty feet high, and sloping steeply towards the river. At the river bank the tundra commences, an endless, inconsiderably undulating plain, full of low marshes and small shallow pools of water, and overgrown with a sparse vegetation, whose flowering time was now almost completely over. Instead we found at our first night quarters (Cape Schaitanskoj) great quantities of ripe cloud-berries, the taste of which, excellent in itself, was on this occasion heightened by the circumstance that they were for us the first fruit of summer. The red whortleberry (*Lingon*) and the cranberry (*Odon*) were also found here, if in small quantity. Cape Schaitanskoj was the most northerly point on the Jenisei, where we found the dwarf birch; and the same place, by Dr. Stuxberg's discovery of a species of *Physa*, becomes the *most northerly locality for land and fresh-water mollusca.*

"After having rested at Cape Schaitanskoj we sailed on with a favourable wind to Sopotschnaja Korga, where the hard wind and a shallow lying off it, the extent of which it was impossible to distinguish during the dusk of the evening, compelled us to lie to earlier than we otherwise intended.

"Sopotschnaja Korga (the toe of the boot) forms a low promontory projecting far out into the Jenisei, which, as numerous ruins of houses show, was formerly inhabited, but is now deserted.

"A great part of the promontory was occupied by heaps of drift-wood, large stems, with branches and roots broken off, thrown up over each other in an endless chaos, it being possible to go forward between them only with difficulty and care. The trees that lie nearest the water are quite fresh and in good condition. Other tree stems lying farther from the bank and cast up there a century or centuries ago, are in all possible intermediate states from fresh to completely decayed wood. Between the stems there frequently occur deep holes filled with black stinking water. Heaps of drift-wood like those at this place, though perhaps somewhat smaller, are found almost everywhere farther down towards the mouth of the river, but higher up there occur only scattered pieces of drift-wood, and at some places these are entirely wanting. The point was, besides, bestrewn with a number of other fresh-water ponds, more or less grown up with water mosses, and full of sticklebacks, Branchiopoda, and other fresh-water Crustacea, and giving the botanist an opportunity of collecting various grasses and water-plants not found farther north (*Carex chondrorhiza*, *Hippuris vulgaris*, *Juncus castaneus*, &c.) Higher up, on drier places, the ground was sparingly covered with *Empetrum nigrum* and *Andromeda tetragona*, and on the steep slopes with which the ground terminates towards the promontory, there is a luxuriant vegetation a couple of feet high, consisting of grass and other plants. The locality was, on the contrary, extremely poor, as well in Mammalia and birds as in insects, and even the holes and paths of the lemming, by which the land on the coast of Novaya Zemlya is crossed in all directions, are found here only in limited number.

"We sailed on until we finally succeeded in finding a convenient landing-place in the neighbourhood of a little river, Mesenkin, which there falls into the Jenisei on its right bank." Here they obtained a Cossack, Feodor, as guide. While waiting for the guide, the party employed themselves "in examining the natural history of the locality, in making solar observations to determine the position of the place, &c. It appeared by these that our resting-place was situated only about four Swedish (over twenty-four English) miles south of our former landing-place. Mesenkin's low river valley is, however, much better protected from the winds of the polar sea than the low promontory at Sopotschnaja, and the influence of this was plainly recognisable by its much richer vegetation.

"What first meets the eye on landing is a thicket of dark green bushes about four feet high, which are found to consist of alder (*Alnus fructicosa*). Between the alder-bushes, and protected by them, our botanist found a number of well-grown plants—Sanguisorba, Galium, Delphinium, Hedysarum, Veratrum, &c. The Salix bushes were also higher here than at former places, the mat of grass more abundant, and the slopes of the sandhills in the interior of the country were adorned with a number of new types—Alyssum, Dianthus, Oxytropis, Saxifraga, Thymus, &c.

"As has been mentioned in a former letter, we found at the part of Jalmal visited by us neither small stones nor sub-fossil shells in the fine sand. East of the mouth of the Jenisei the sand is coarser, and contains both sub-fossil shells and large and small stones. The sub-fossil shells, according to information given to me at Dudinka, occur in some places in so large masses that they form true shell banks. At the places visited by us the shells were found not in proper layers, but only scattered through the sand. Immediately at the first glance it appeared that the shells collected by us here belonged in preponderating number to species with which we had become acquainted in the living state during our dredging in the seas of Kara and Obi-Jenisei.

"A sample of the stones which occur in the sandy strata of the tundra was always found at the river bank where we lay, when the lighter particles of sand were washed away, and many important contributions towards a knowledge of the way in which the tundra is formed, and of the nature of the rocks which afforded material for the masses of sand here collected together, were to be obtained. No erratic blocks comparable in size to the erratic blocks in our country occur here, a circumstance which I regard as a proof that the sandy strata of the tundra, at least in these regions, are not of glacial origin. I ought, however, to remark that on a small stone here and there there could be observed striæ and scratches completely resembling those found on moraine blocks. But in such cases these scratches have clearly been formed either by the sliding of the earthy stratum or by the action of the river ice.

"In the northern part of the tundra I could never discover among the stones washed out from the sand any blocks of granite or gneiss, but they consisted for the most part of different kinds of basalt with numerous cavities containing lime and zeolites. Besides there occurred, especially at Cape Schaitanskoj, in not inconsiderable number, blocks of marl and sandstone, containing fossils partly of marine origin, partly containing rolled tree stems, more or less carbonised or petrified. Pieces of brown and pit coal were also found here in not inconsiderable number.

"On Aug. 26, early in the morning, our guide joined us, accompanied by five other Russians settled in that region. . . . After having talked for some time with our friendly guests, who were exceedingly interested in our expedition, we continued our journey, during which we had splendid calm weather, to Cape Gostinoi, where we took our midday rest.

"After resting a little at midday at this place, we sailed on, and came after various wanderings in dusk and mist during the night before Aug. 27, to land at a low promontory, at the mouth of the river Jakowiewa.

"Our next resting-place was a specially attractive fishing station at a small sound between the Briochowski Islands, the most northerly of the labyrinth of islands which occupy the channel of the Jenisei between 69⅓° and 70⅓°.

"On Aug. 28 we rowed on between a number of islands covered with a luxuriant vegetation, and commonly terminating towards the river with a steep slope, down which large masses of peat tumbled here and there. At such places we could see that the island originally consisted of a sand-bank cast up by the river, which in the length of time was covered first with masses of drift-wood, and afterwards with a luxurious vegetation which gradually gave origin to a thick stratum of peat, of which the part of the island above the surface of the water is mostly formed.

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* Its occurrence is remarkable on this account, that the ground here, with the exception of an inconsiderable stratum which thaws in summer, is constantly frozen all the year round.

"Towards evening we lay to at the Nikandrow Islands in the neighbourhood of a fishing-station still inhabited. Jenisei is renowned for its richness in large eatable fish-species. . . . I hope some months after our return home to be able to exhibit to those among us who are interested in fishing, specimens of most of the varieties of fish occurring here. During our sailing up the river between Dudinka and Jeniseisk, I caused specimens of all the species of fish which we could procure from the river to be carefully deposited in a cask filled with spirit. This collection will be sent to Stockholm *viâ* St. Petersburg, by a merchant settled in Jeniseisk.

"Like most of the settlers on the lower course of the Jenisei, the inhabitants at Nikandvow fishing-station kept a number of dogs which are believed to be of the same race as the dogs used on Greenland, for draught. The dogs are employed in summer to tow boats up the river, and in winter for all sorts of carriages. Yet the dog, for reasons stated in the introduction to Middendorff's 'Sibirische Reise,' is considered quite unfit for long journeys over uninhabited tracts, if several hunting or fishing stations are not to be met with in the course of the journey. In such cases reindeer are always employed.

"Early next day we sailed, or more correctly, rowed on, the weather being calm and beautiful. We rested at midday in the neighbourhood of a now deserted *simovie* on the southern part of Sopotschnoi Island. Hence we continued our journey first to Cape Maksuninskoj, where we visited a Samoyede family that had set up their skin tent here in order to collect the necessary stock of fish for winter; afterwards to Tolstöj Nos, a still inhabited, well-built *simovie*, where the people living there received us in a very friendly way, and received the account of our journey with great interest and astonishment."

From here the party made haste to catch the last steamer at Saostrowoskoj, in the neighbourhood of Dudinka, which they did on Aug. 31.

"We were yet far north of the Arctic circle, and as many imagine that the region we had now passed through, the so little-known tundra of Siberia, is a desert waste, either covered by ice and snow or by an exceedingly scanty moss vegetation, it is perhaps the place here to declare that this by no means is the case. On the contrary, we saw, during our passage up the Jenisei, snow only at one place, a deep valley cleft of some fathoms' extent, and the vegetation, especially on the islands which are overflowed during the spring floods, was remarkable for a luxuriance to which I had seldom before seen anything corresponding.

"The fertility of the soil and the immeasurable extent of the meadow land and the richness of the grass upon it had already called forth from one of our hunters, a middle-aged man, who is owner of a little patch of ground between the fells in Northern Norway, a cry of envy of the splendid land our Lord had given 'the Russian,' and of astonishment that no creature pastured, no scythe mowed the grass. Daily and hourly we heard the same cry repeated, though in yet louder tones, when we some weeks after came to the lofty old forests between Jeniseisk and Turuchansk, or to the nearly uninhabited plains on the other side of Krasnojarsk, covered with deep *tschornosem* (black earth)—in fertility certainly comparable to the best parts of Scania, in extent exceeding the whole of the Scandinavian peninsula. This direct expression of opinion by a veritable if unlearned agriculturist may perhaps not be without its interest in judging of the future of Siberia.

"During this very summer three separate Russian expeditions have travelled through Siberia with the view of ascertaining the possibility of improving the river communication within the country. These expeditions have, according to unofficial communications made to me in Jeniseisk, come to the conclusion that it is possible for a sum of 700,000 roubles to make the Angara (a tributary of the Jenisei) navigable to Lake Baikal, and to connect the Obi with the Jenisei and the Jenisei with the Lena. How great an extent of territory the proposed river communication will embrace is best seen by considering that the territory drained by the Obi-Irtisch and the Jenisei alone is of greater extent, according to Von Baer's calculation, than the river areas of all the rivers (the Danube, Don, Dnieper, Dniester, Nile, Po, Ebro, Rhone, &c.), which fall into the Black Sea, the Sea of Marmora, and the Mediterranean. Part of this territory indeed lies north of the Arctic circle, but here too are found the most extensive and finest forests of the globe; south of the forest region proper there stretch out territories, several hundred leagues in extent, level, free of stones, covered with the most fertile soil, which only wait for the plough of the cultivator to yield the most abundant harvests; and farther to the south the Jenisei and its tributaries run through regions where the grape ripens on the bare ground: just now, as I write this, I have before me a bunch of the finest Siberian grapes. May the future show that sea communication between these lands and Europe has now been fairly inaugurated.

"A. E. NORDENSKJÖLD."

SCIENTIFIC SERIALS

Der Naturforscher, October 1875.—In this number is given an observation by M. Coulier, that while a cloud was formed in a vessel containing a little water, when an attached caoutchouc balloon was first compressed, then allowed to expand, no cloud was thus produced if the vessel had stood some time at rest, or if the air had been filtered; and the author's view was confirmed that small particles in the air were what caused the formation. M. Mascart has found that strongly ozonised air is not robbed of its cloud-forming action by filtering.—There are two valuable papers in meteorology, one by M. Hann, on the variability of daily temperature, and another in which M. Kerner offers an explanation of the fact that there is, in the Swiss valleys, in late autumn and winter, a middle warm region limited both below and above by a colder.—In physiology we note some interesting researches by M. Bernstein as to what is the highest pitch of tone a muscle may be made to give by electric stimulation. Above 418 vibrations per second of the spring contact, the muscle tone (the same as that of the spring) was distinct, though weaker; at 1,056 vibrations no distinct tone was observed, only a noise. But if the *nerve* were stimulated to the latter degree the muscle gave a tone, not indeed the same as the spring, but a fifth, sometimes an octave, lower. The upper limit beyond which the muscle ceased to give the same tone with the spring (in this arrangement) seemed to be about 933 vibrations. Under chemical stimulus of a nerve, the connected muscle gave a tone like that in natural contraction.—There is also a suggestive paper by M. Delbœuf on the theory of sensation, and M. Hirschberg describes observations on a boy who acquired sight at seven years of age; they favour, he considers, the empiristic theory of sight-perceptions.—In a paper on the origin of the deep-water fauna of the Lake of Geneva, M. Forel thinks the entire fauna of the Swiss lakes are descended from forms which have migrated (up the rivers) since the melting of the glaciers, and have afterwards been differentiated.

Zeitschrift der Oesterreichischen Gesellschaft für Meteorologie, Oct. 1.—Dr. Wild, Director of St. Petersburg Observatory, relates the circumstances which led to the Imperial assent being given in June last to the scheme for the establishment at Pawlowsk, distant about an hour by railway from St. Petersburg, of an observatory to be affiliated to the central institution for terrestrial physics over which he presides. The Central Observatory was built twenty-six years ago in an open and quiet space outside the capital. Houses and streets have, however, rapidly been constructed around it, masses of iron are in proximity, and noise and smoke disturb physical measurements, magnetic and meteorological observations. Herr Wild knew that there were serious objections to the removal of the whole establishment into the country, as has been done at Vienna, and determined to recommend a separation into two divisions, one observing and the other administrative, in imitation of the London Meteorological Office and Kew Observatory, the relations to the public of the Russian being similar to those of the English Meteorological Department. On his making this proposal at the Academy of Sciences last autumn, Prince Nicolajewitsch generously presented for the purposes of the new observatory a large piece of ground in his park at Pawlowsk. There will be no reduction in the estimate for the Central Observatory, in order that local observations may be continued, and the accumulated records of former years worked out.—Dr. Hellmann contributes a paper on the physical conditions of the higher atmospheric strata, in which he discusses the observations made in May 1872 by the U.S. War Department at the summit (1,915 metres high), and at the base of Mount Washington, New Hampshire. It appears among other results that the mean difference of temperature for 100 metres of ascent between the hours of 6 A.M. and 6 P.M. and 9 P.M. and 12 P.M. at night was ·69° C., and that the difference between 4 and 5 P.M. was ·83 and at 6 A.M. only ·48° C.; that in 17·4 cases per cent. the wind at the top was the same in